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PATENT ABSTRACTS OF JAPAN

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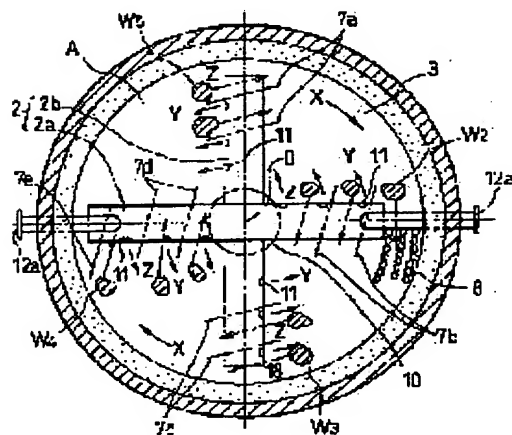
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(54) WASTE INCINERATOR

(57)Abstract:

PROBLEM TO BE SOLVED: To efficiently dry a material to be treated in a furnace by burning a material to be treated which is fed onto a rotary furnace bed from a portion which supplies the material to be treated while moving the material to be treated in a zigzag pattern toward an ash discharge opening by rotating the rotary furnace bed and guiding with guide blades.

SOLUTION: A material to be treated which is thrown into a furnace inside A of a waste incinerator from a portion for supplying material to be treated which is disposed outside is fell onto a rotary furnace bed 3 which is rotating in a rotating direction X at a low speed. The material to be treated is placed at a position of an outside material W2 to be treated and is slid on the rotary furnace bed 3 and crushed into small pieces by extremities of connected agitating chains 8. Subsequently, with the



rotation of the rotary furnace bed 3 in the rotating direction X while guided by guide blades 7a-7e, the material W2 is moved in a zigzag manner $W2 \rightarrow W3 \rightarrow W4 \rightarrow W5$ to a position right outside of an ash discharge opening 10. With a stabilizing burner 5, a combustion heat of approximately $800-850^{\circ}\text{C}$ is supplied in a furnace wall direction so as to carry out drying and incinerating.

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CLAIMS

[Claim(s)]

[Claim 1] It is supposed at the circumference of the center of rotation at the lower base section of the body of an incinerator which has an exhaust gas exhaust port and a processed material feed zone in upper limit that it is pivotable. A circular rotary furnace floor, The hollow duct-like churning shaft of the pair which made said center of rotation the intersection, intersected perpendicularly with said method of rotary furnace above the floor level, and was fixed to said body of an incinerator, Two or more tabular guide vanes fixed by inclining by turns on the inside and the outside to the hand of cut of the combustion air port which turned to said each churning shaft caudad, and carried out two or more openings to it from the horizontal with the hand of cut and reverse sense of said rotary furnace floor, and said rotary furnace floor, and consisting this rotary furnace side above the floor level and few gaps, It has the combustion air-intake connected with one [said] churning axis end section, and the ashes exhaust port arranged in the core of said rotary furnace floor. The processed material supplied to said rotary furnace above the floor level from said processed material feed zone is a waste incinerator characterized by making combustion possible, moving to an ashes exhaust port in the shape of zigzag with rotation of said rotary furnace floor and said guide vane.

[Claim 2] The waste incinerator characterized by having the guide vane of the piece which raked up the processed material of said rotary furnace floor periphery section on the chain-like churning chain which dragged the rotary furnace side above the floor level, and was hung possible, and/or the maximum outside of the other end of said churning shaft, and fixed possible from the churning shaft end section in the waste incinerator according to claim 1 near the processed material supply location to a rotary furnace side above the floor level.

[Claim 3] The screw injection machine which has the vertical mold screw with which the processed material feed zone was supported to revolve in the inside of cylindrical ** and this ** more pivotable than the upper part in a waste incinerator according to claim 1 or 2, The waste incinerator characterized by enabling fall in a furnace, the narrow diameter side of the choke tube from which it connected with horizontal introductory piping and this introductory piping with which the processed material source of supply was connected with the terminal, and the cross section was extracted being equipped with the processed material charging line brought alongside said Higami section, and cutting a processed material in the shape of a pellet.

[Claim 4] The waste incinerator characterized by making the lower limit section of a guide vane into a curve side in a waste incinerator according to claim 1 to 3.

[Claim 5] The waste incinerator characterized by making the curve side of a guide vane into the point configuration of the shape of a plow or ** in a waste incinerator according to claim 4.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to amelioration of the incinerator of processed materials, such as a cake of the flood part sludge of city sewage or industrial liquid waste.

[0002]

[Description of the Prior Art] As a conventional waste incinerator, the thing of a publication is in the registration utility model official report No. 3021466 and a No. 3021467 official report. The burned object which rotates with a hearth is performing incineration processing of medical waste and kitchen waste by these incinerators' equipping air supply tubing which has two or more air nozzles for combustion to the rotary furnace floor with two or more crack wings prepared in the shape of suspension, and cracking the periphery section in a crack wing, and a new front face's being exposed, burning, and being discharged from a central exhaust port.

[0003]

[Problem(s) to be Solved by the Invention] In the above mentioned conventional incinerator, processed materials of desiccation and combustion, such as a cake of the flood part sludge of city sewage or industrial liquid waste, are insufficient, a processed material is partially solidified in the shape of a clinker during combustion, the perfect combustion in a furnace is difficult, and the lock out in a furnace may be invited, for example. On the other hand, in this invention, the processed material of these cakes etc. is efficiently dried in a furnace, and it aims at obtaining the waste incinerator which can promote combustion.

[0004]

[Means for Solving the Problem] If it is in invention of claim 1 in order to gain said purpose It is supposed at the circumference of the center of rotation at the lower base section of the body of an incinerator which has an exhaust gas exhaust port and a processed material feed zone in upper limit that it is pivotable. A circular rotary furnace floor, The hollow duct-like churning shaft of the pair which made said center of rotation the intersection, intersected perpendicularly with said method of rotary furnace above the floor level, and was fixed to said body of an incinerator, Two or more tabular guide vanes fixed by inclining by turns on the inside and the outside to the hand of cut of the combustion air port which turned to said each churning shaft caudad, and carried out two or more openings to it from the horizontal with the hand of cut and reverse sense of said rotary furnace floor, and said rotary furnace floor, and consisting this rotary furnace side above the floor level and few gaps, It has the combustion air-intake connected with one [said] churning axis end section, and the ashes exhaust port arranged in the core of said rotary furnace floor. It was solved with the waste incinerator whose combustion is enabled, the processed material supplied to said rotary furnace above the floor

level from said processed material feed zone moving to an ashes exhaust port in the shape of zigzag with rotation of said rotary furnace floor and said guide vane. If it is in invention of claim 2, in a waste incinerator according to claim 1, it is desirable to consider as the waste incinerator which equips the chain-like churning chain which dragged the rotary furnace side above the floor level from the churning shaft end section, and was hung possible, and/or the maximum outside of the other end of said churning shaft with the guide vane of the piece which raked up the processed material of said rotary furnace floor periphery section, and fixed possible near the processed material supply location to a rotary furnace side above the floor level. If it is in invention of claim 3, it sets to a waste incinerator according to claim 1 or 2. The screw injection machine which has the vertical mold screw with which the processed material feed zone was supported to revolve in the inside of cylindrical ** and this ** more pivotable than the upper part, It is desirable to consider as the waste incinerator whose fall in a furnace is enabled, the narrow diameter side of the choke tube from which it connected with horizontal introductory piping and this introductory piping with which the processed material source of supply was connected with the terminal, and the cross section was extracted being equipped with the processed material charging line brought alongside said Higami section, and cutting a processed material in the shape of a pellet. If it is in invention of claim 4, in a waste incinerator according to claim 1 to 3, the lower limit section of a guide vane can consider as the waste incinerator made into the curve side. If it is in invention of claim 5, in a waste incinerator according to claim 4, the curve side of a guide vane can consider as the waste incinerator made into the point configuration of the shape of a plow or **.

[0005]

[Embodiment of the Invention] The gestalt of operation of this invention is explained to a detail below based on a drawing. drawing 1 shows the whole example of the waste incinerator of this invention -- it is drawing of longitudinal section a part. Drawing 2 is a **** outline top view in the direction of B-B about the rotary furnace floor of the waste incinerator of drawing 1. Drawing 3 is the outline side elevation showing the other examples of the guide vane of the waste incinerator of this invention. Drawing 4 is the approximate account Fig. of drawing 1 and the churning shank of the waste incinerator of 2. drawing 5 -- drawing 1 R> -- it is the outline side elevation of churning **** of the waste incinerator of 1 and 2. drawing 6 shows drawing 1 and the screw injection machine of the waste incinerator of 2 -- it is drawing of longitudinal section a part.

[0006] The waste incinerator 1 of this invention is seen from the upper part centering on the center of rotation O by the driver 6 on the periphery frame 18 with which the circular rotary furnace floor 3 was connected caudad, for example, is made pivotable to the clockwise rotary furnace floor hand of cut X, and is supported by the approximately cylindrical lower base section of the body 4 of an incinerator set up by the stand 17 on a foundation at the surface section horizontal. Spacing is consisted above the rotary furnace floor 3, and the churning shaft 2 intersects perpendicularly considering the center of rotation O as an intersection, and is fixed to the body 4 of an incinerator. Furthermore, the combustion air-intakes 12b and 12b into the body 4 of an incinerator are arranged in the exhaust gas exhaust port 16 and the processed material feed zone mentioned later, and a top side by upper limit, and are arranged in the stabilizing burner 5 and the bottom side by the combustion air-intakes 12a and 12a to the churning shaft 2, and the side face at the body 4 of an incinerator, respectively. The ashes exhaust port 10 with which a lower limit is connected in ashes cooling and a transport device (illustration abbreviation) is arranged in the core of the rotary furnace floor 3, and the edge

protrudes on the outskirts of ashes exhaust port 10 of the rotary furnace floor 3. the combustion air breathing by which the churning shaft 2 is a hollow duct-like, and the cooling air intake 12a and 12a was formed successively by both ends -- churning shaft 2a of business and churning shaft 2b for combustion-air distribution are opened for free passage on the intersection. The combustion air port 11 of opening of a large number [inside / of churning shaft 2a and 2b] which the combustion air sent from the combustion air-intakes 12a and 12a can blow off is drilled in the hand of cut X of the rotary furnace floor 3, and the combustion-air blow-off direction Y caudad turned from a horizontal with the reverse sense by churning shaft 2a and 2b.

[0007] Two plate-like guide vane each 7b which concluded from the upper part that processed materials W2 and W4 were brought near inside the ashes exhaust port 10 by the rotation to the hand of cut X of the rotary furnace floor 3, and inclined inside to the hand of cut X as shown in churning shaft 2a at drawing 2 , 7d sets spacing and is fixed, and a guide vanes [7b and 7d] lower limit has few gaps by rotary furnace floor 3 top face and abbreviation parallel, and makes plow return of a processed material possible. Furthermore, the chain-like churning chain 8 hung by the end of churning shaft 2a drags rotary furnace floor 3 top face, and fixes a terminal to possible die length, the churning chain 8 drags, and a massive processed material is unfolded by operation. In order that spacing may be set to the other end of churning shaft 2a on the maximum outside of 7d of guide vanes and the rotary furnace floor 3 periphery section may rake up, one guide vane 7e has fixed. The sense of guide vane 7e may not be the same as that of 7d of guide vanes. It is not necessary to necessarily equip with the churning chain 8 and/or guide vane 7e here. Two plate-like guide vane each 7a which concluded from the upper part that processed material W3 and W5 were brought near by the outside of the ashes exhaust port 10 by the rotation to the hand of cut X of the rotary furnace floor 3, and inclined outside to the hand of cut X as shown in churning shaft 2b at drawing 2 R> 2, 7c sets spacing and is fixed, and the lower limit of guide vanes 7a and 7c has few gaps by rotary furnace floor 3 top face and abbreviation parallel, and makes plow return of a processed material possible. What is necessary is to set guide vanes 7a, 7b, 7c, and 7d by the gestalt of a processed material, and/or the diameter of a waste incinerator, to choose them suitably, and just to prepare them, although explained as two pieces each. [two or more]

[0008] Below, other alternative components of a waste incinerator 1 are explained. The screw injection machine 9 and the processed material charging line 13 are fixed to the upper limit section of the body 4 of an incinerator as drawing 1 and a processed material feed zone shown in 6. The screw injection machine 9 has screw 9b of the vertical mold supported to revolve pivotable by the upper driver 15 in the inside of cylindrical ** 9a of straight side, and ** 9a in the processed material fall direction Q of the gravity direction as for which processed material intake 9c carried out opening to the lower limit, and the processed material charging line 13 is brought alongside the ** 9a upper part by the axial center horizontal. The processed material charging line 13 has introductory piping 13a by which the feed pump (illustration abbreviation) was connected with the processed material source of supply, and choke tube 13b which extracted the cross section, charging line 13a and choke tube 13b are connected, and the narrow diameter side of choke tube 13b is brought alongside the cylindrical ** 9a upper part. Only the configuration which connected piping from a feed pump with the processed material source of supply simply depending on the gestalt of a processed material is sufficient as a processed material feed zone. Guide vane 7a' in which a gap is set on the rotary furnace floor 3 top face, and a lower limit has a curve side according to the gestalt of a processed material as

guide vanes 7a, 7b, 7c, and 7d are replaced with plate-like and it is shown in drawing 3, 7b', 7c', and 7d' can be arranged. Although the various configurations of the configuration of the curve side here are selectable according to the gestalt of a processed material, the parts of radii, an ellipse, a parabola, etc., these combination, a plow, or the point configuration of ** is used, for example. Usually, by making this into a curve side configuration especially a plow, or the point configuration of **, in the case of the processed material which is easy to become massive, a powerful plow return operation is possible, and it is desirable to it.

[0009] Next, actuation of a waste incinerator 1 is explained. In processed materials, such as a cake of flood part sludge, such as city sewage or industrial liquid waste, water content usually reaches also to 80%. In order to burn this processed material efficiently, in order to promote desiccation of a cake, the cake was cracked to the pellet so that it might not become the biggest possible lump in the middle of desiccation, it is necessary to make it expand surface area uniformly, and the waste incinerator 1 has attained these by said configuration. In drawing 2, the processed material W1 thrown in from the processed material feed zone from the exterior in [A] the furnace has rotary furnace floor 3 top face first dragged by the hand of cut X with the terminal of the chain-like churning chain 8 which falls to the rotary furnace floor 3 as for which 0.2 - 0.5rpm is carrying out low-speed rotation, is laid in the location of the outside processed material W2, and is hung from the churning shaft 2a end, and is crushed by the pellet. Subsequently, although a processed material W2 shifts with processed material W2 → W3 → W4 → W5 by rotation to the hand of cut X of the rotary furnace floor 3 It rotates showing around serially at guide vane 7b → 7c → 7d → 7a which has fixed to churning shaft 2a and 2b, changing the sense and a location in an inside → outside → inside → outside, and the zigzag-like direction Z of processed material furnace internal transmigration to a hand of cut X, and being cracked by the pellet. it brings near inside the rotary furnace floor 3 serially -- having -- the ashes exhaust port 10 -- an outside location is arrived at immediately. Since the surface area which the residence time increases by shift of the shape of zigzag of a processed material in the meantime, and an opening increases to a processed material according to the crack operation to a pellet, and the hot blast for desiccation passes increases, heat exchange can be attained efficiently. The temperature in [A] a furnace is easy to adjust for about 800-850 degrees C if a stabilizing burner 5 is used. When guide vane 7a' which has the lower limit curve side shown in drawing 3, 7b', 7c', and 7d' are used, processed materials W2-W5 move in the plow return direction S, and can carry out desiccation and incineration efficiently further according to this plow return operation.

[0010] The cooling air sent in churning shaft 2a and 2b from the cooling air intake 12a and 12a on the other hand Distribute caudad towards a hand of cut X and the cooling air blow-off direction Y of the reverse sense from a horizontal from the cooling air outlet 11, and it is emitted in [A] a furnace. By making the gas stream in [A] a furnace start a revolution style by this, and spraying a processing [in which it does not dry] object by passing the heat of combustion of a processed material in the direction of a furnace wall, heat of combustion acts effective in desiccation, and desiccation of a processed material and incineration are promoted. Although air hits a processed material intensively in the direction of perpendicular facing down although the combustion-air blow-off direction from a combustion air port was emitted in the direction of perpendicular facing down, local combustion is caused, that part became an elevated temperature and it solidified in the shape of a clinker partially, and it was caught in the guide vane or the lock out in a furnace tended to take place [the perfect combustion in a furnace is difficult and] with the conventional technique, this technical problem is cancelable in

a waste incinerator 1. Moreover, the churning shaft 2 and guide vanes [7a 7b, 7c, and 7d] temperature rise can be prevented by the combustion air sent from the combustion air-intakes 12a and 12a here. A processed material [finishing / the desiccation which finally gave to the latest outside of the ashes exhaust port 10, and was deposited gradually, and incineration] overcomes the edge which protruded on ashes exhaust port 10 perimeter, is discharged by the ashes exhaust port 10 to the outside in [A] a furnace, and is sent to the ashes processor of another process which carried out the illustration abbreviation from it. The exhaust gas after combustion is discharged by the exhaust gas exhaust port 16, and is sent to the exhaust gas eject direction R from it to the offgas treatment equipment of another process which carried out the illustration abbreviation.

[0011] It is made to fall in the processed material fall direction Q into [A] a furnace, once supplying a processed material in the processed material supply direction P by the feed pump at charging line 13a and narrowing down by choke tube 13b, when using the screw injection machine 9, the wing of screw 9b in which carries out emission expansion in the cylindrical ** 9a upper part, for example, 30 – 200rpm is carrying out high-speed rotation cutting a processed material in the shape of [of fist extent] a pellet. The screw injection machine 9 is effective for leading to the successive state, being easy to fall, and especially making this processed material into the shape of a pellet, when an adhesive processed material is supplied into [A] a direct furnace by the feed pump. Moreover, by having used screw 9b as the vertical mold, it is effective in preventing that the cut processed material re-coalesces mutually.

[0012]

[Effect of the Invention] According to the waste incinerator of this invention, the perfect combustion in a furnace is possible, without solidifying in the shape of a clinker partially, while burning processed materials, such as a cake of flood part sludge, such as city sewage or industrial liquid waste, without inviting the lock out in a furnace, it can dry efficiently and combustion can be promoted. Moreover, by adding a screw injection machine, it can cut in the shape of a pellet, without an adhesive processed material's leading to the successive state, and falling, and more efficient desiccation and combustion in a furnace are possible. Furthermore, when the guide vane which has a lower limit curve side is used, a processed material can receive a powerful plow return operation, and can carry out desiccation and incineration efficiently still further.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] the whole example of the waste incinerator of this invention is shown -- it is drawing of longitudinal section a part.

[Drawing 2] It is a **** outline top view in the direction of B-B about the rotary furnace floor of the waste incinerator of drawing 1.

[Drawing 3] It is the outline side elevation showing the other examples of the guide vane of the waste incinerator of this invention.

[Drawing 4] It is the approximate account Fig. of drawing 1 and the churning shank of the waste incinerator of 2.

[Drawing 5] They are drawing 1 and the outline side elevation of churning **** of the waste incinerator of 2.

[Drawing 6] drawing 1 and the screw injection machine of the waste incinerator of 2 are shown -- it is drawing of longitudinal section a part.

[Description of Notations]

- 1 Waste Incinerator
- 2, 2a, 2b Churning shaft
- 3 Rotary Furnace Floor
- 4 Body of Incinerator
- 5 Stabilizing Burner
- 6 15 Driver
- 7a-7e, 7a'-7d' Guide vane
- 8 Churning Chain
- 9 Screw Injection Machine
- 9a **
- 9b Screw
- 9c Processed material intake
- 10 Ashes Exhaust Port
- 11 Combustion Air Port
- 12a, 12b Combustion air-intake
- 13 Processed Material Charging Line
- 13a Introductory piping
- 13b Choke tube
- 16 Exhaust Gas Exhaust Port
- 17 Stand
- 18 Frame

A Inside of a furnace
O Center of rotation
P The processed material supply direction
Q The processed material fall direction
R Exhaust gas eject direction
S The plow return direction
X Rotary furnace floor hand of cut
Y The combustion-air blow-off direction
Z The direction of processed material furnace internal transmigration
W1-W5 Processed material

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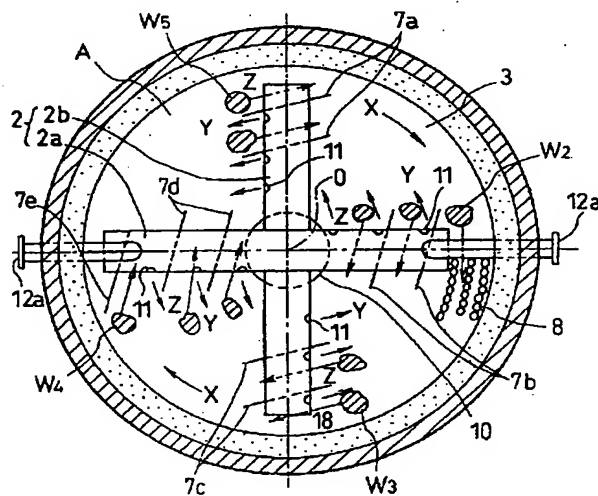
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(54) 【発明の名称】 廃棄物焼却炉

(57) 【要約】

【課題】 高水分汚泥の脱水ケーキ等の被処理物を効率的に乾燥し、燃焼を促進することのできる廃棄物焼却炉を得ること。

【解決手段】 排ガス排出口及び被処理物供給部を有する焼却炉本体の下底部に回転中心回りに回転可能とされ円形の回転炉床と、回転炉床上方に回転中心を交点とし直交して焼却炉本体に固設された一対の中空ダクト状攪拌軸と、各攪拌軸に回転炉床の回転方向と逆向きで水平から下方に向けて複数開口した燃焼空気吹出口と回転炉床の回転方向に対し内側及び外側に交互に傾斜し回転炉床上面と僅かの間隙を存して固設された複数の板状案内羽根と、一方の攪拌軸端部に連結された燃焼空気取入口と、回転炉床に配設された灰排出口とを備え、被処理物供給部より回転炉床上に供給された被処理物は回転炉床の回転と案内羽根によりジグザグ状に灰排出口まで移動しつつ燃焼可能とされている廃棄物焼却炉。



【特許請求の範囲】

【請求項1】 上端に排ガス排出口及び被処理物供給部を有する焼却炉本体の下底部に回転中心回りに回転可能とされ円形の回転炉床と、前記回転炉床上方に前記回転中心を交点とし直交して前記焼却炉本体に固設された一対の中空ダクト状攪拌軸と、前記各攪拌軸に前記回転炉床の回転方向と逆向きで水平から下方に向けて複数開口した燃焼空気吹出口と前記回転炉床の回転方向に対し内側及び外側に交互に傾斜し該回転炉床上面と僅かの間隙を存して固設された複数の板状案内羽根と、前記一方の攪拌軸端部に連結された燃焼空気取入口と、前記回転炉床の中心部に配設された灰排出口とを備え、前記被処理物供給部より前記回転炉床上に供給された被処理物は前記回転炉床の回転と前記案内羽根によりジグザグ状に灰排出口まで移動しつつ燃焼可能とされていることを特徴とする廃棄物焼却炉。

【請求項2】 請求項1に記載の廃棄物焼却炉において、回転炉床上面への被処理物供給位置近傍に攪拌軸一端部より回転炉床上面を引摺り可能に吊下げられた連鎖状の攪拌鎖及び／又は前記攪拌軸の他端部の最外側に前記回転炉床外周部の被処理物を搔寄せ可能に固着された一個の案内羽根を備えていることを特徴とする廃棄物焼却炉。

【請求項3】 請求項1又は2に記載の廃棄物焼却炉において、被処理物供給部は円筒状樋と該樋内を上方より回転可能に軸支された縦型スクリュウとを有するスクリュウ投入機と、端末に被処理物供給源が繋がれた水平方向の導入配管と該導入配管に連結され断面を絞った絞り管の細径側が前記樋上部に横付けされた被処理物供給配管とを備え、被処理物を小塊状に切断しつつ炉内に落下可能とされていることを特徴とする廃棄物焼却炉。

【請求項4】 請求項1～3のいずれかに記載の廃棄物焼却炉において、案内羽根の下端部が湾曲面とされていることを特徴とする廃棄物焼却炉。

【請求項5】 請求項4に記載の廃棄物焼却炉において、案内羽根の湾曲面が鋤又は犁状の先端部形状とされていることを特徴とする廃棄物焼却炉。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、都市下水又は工場排水の高水分汚泥の脱水ケーキ等の被処理物の焼却炉の改良に関する。

【0002】

【従来の技術】従来の廃棄物焼却炉として、例えば登録実用新案公報第3021466号、3021467号公報に記載のものがある。これらの焼却炉は、回転炉床上に複数の燃焼用空気ノズルを有する空気供給管に垂下状に設けられた複数の解砕羽根を備え、炉床とともに回転する被燃焼物は解砕羽根に当たって外周部が解砕され新しい表面が露出し燃焼され中央排出口から排出されること

により、医療廃棄物や厨房廃棄物の焼却処理を行っている。

【0003】

【発明が解決しようとする課題】前記した従来の焼却炉では、例えば都市下水或いは工場排水の高水分汚泥の脱水ケーキ等の被処理物では乾燥及び燃焼が不十分で、被処理物は燃焼中に部分的にクリンカー状に固化し、炉内での完全燃焼が困難で炉内の閉塞を招来することがある。これに対し本発明では、これらの脱水ケーキ等の被処理物を炉内において効率的に乾燥し、燃焼を促進することのできる廃棄物焼却炉を得ることを目的とする。

【0004】

【課題を解決するための手段】前記目的を得るため、請求項1の発明にあっては、上端に排ガス排出口及び被処理物供給部を有する焼却炉本体の下底部に回転中心回りに回転可能とされ円形の回転炉床と、前記回転炉床上方に前記回転中心を交点とし直交して前記焼却炉本体に固設された一対の中空ダクト状攪拌軸と、前記各攪拌軸に前記回転炉床の回転方向と逆向きで水平から下方に向けて複数開口した燃焼空気吹出口と前記回転炉床の回転方向に対し内側及び外側に交互に傾斜し該回転炉床上面と僅かの間隙を存して固設された複数の板状案内羽根と、前記一方の攪拌軸端部に連結された燃焼空気取入口と、前記回転炉床の中心部に配設された灰排出口とを備え、前記被処理物供給部より前記回転炉床上に供給された被処理物は前記回転炉床の回転と前記案内羽根によりジグザグ状に灰排出口まで移動しつつ燃焼可能とされている廃棄物焼却炉により解決した。請求項2の発明にあっては、請求項1に記載の廃棄物焼却炉において、回転炉床上面への被処理物供給位置近傍に攪拌軸一端部より回転炉床上面を引摺り可能に吊下げられた連鎖状の攪拌鎖及び／又は前記攪拌軸の他端部の最外側に前記回転炉床外周部の被処理物を搔寄せ可能に固着された一個の案内羽根を備えている廃棄物焼却炉とするのが好ましい。請求項3の発明にあっては、請求項1又は2に記載の廃棄物焼却炉において、被処理物供給部は円筒状樋と該樋内を上方より回転可能に軸支された縦型スクリュウとを有するスクリュウ投入機と、端末に被処理物供給源が繋がれた水平方向の導入配管と該導入配管に連結され断面を絞った絞り管の細径側が前記樋上部に横付けされた被処理物供給配管とを備え、被処理物を小塊状に切断しつつ炉内に落下可能とされている廃棄物焼却炉とするのが好ましい。請求項4の発明にあっては、請求項1～3のいずれかに記載の廃棄物焼却炉において、案内羽根の下端部が湾曲面とされている廃棄物焼却炉とすることができ、請求項5の発明にあっては、請求項4に記載の廃棄物焼却炉において、案内羽根の湾曲面が鋤又は犁状の先端部形状とされている廃棄物焼却炉とすることができ

【0005】

【発明の実施の形態】本発明の実施の形態を図面にに基づき以下詳細に説明する。図1は、本発明の廃棄物焼却炉の一例の全体を示す一部縦断面図である。図2は、図1の廃棄物焼却炉の回転炉床部をB・B方向に視た概略平面図である。図3は、本発明の廃棄物焼却炉の案内羽根の他例を示す概略側面図である。図4は、図1、2の廃棄物焼却炉の攪拌軸部の概略説明図である。図5は、図1、2の廃棄物焼却炉の攪拌鎖部の概略側面図である。図6は、図1、2の廃棄物焼却炉のスクリュ投入機を示す一部縦断面図である。

【0006】本発明の廃棄物焼却炉1は、基礎上の架台17に立設された略円筒状の焼却炉本体4の下底部に、外周円形の回転炉床3が下方に連結されたフレーム18上の駆動機6によって回転中心Oを中心として上方より見て例えば時計回りの回転炉床回転方向Xに回転可能にして、表面部水平に支持されている。回転炉床3の上方に間隔を存して攪拌軸2が回転中心Oを交点として直交して焼却炉本体4に固設されている。更に焼却炉本体4には、上端に排ガス排出口16及び後述する被処理物供給部、上側面に助燃バーナ5、下側面に攪拌軸2への燃焼空気取入口12a、12a、側面に焼却炉本体4内への燃焼空気取入口12b、12bがそれぞれ配設されている。回転炉床3の中心部には下端が灰冷却及び搬送装置（図示省略）に連なる灰排出口10が配設され、回転炉床3の灰排出口10周辺には縁部が突設されている。攪拌軸2は中空ダクト状で、両端部に冷却空気取入口12a、12aが連設された燃焼空気取入用の攪拌軸2aと、燃焼空気分配用の攪拌軸2bとが交点において連通されている。攪拌軸2a、2bには、回転炉床3の回転方向Xと逆向きで水平から下方に向けての燃焼空気吹出方向Yに攪拌軸2a、2b内より燃焼空気取入口12a、12aから送られて来た燃焼空気が吹出可能な多数の開口の燃焼空気吹出口11が穿設されている。

【0007】攪拌軸2aには図2に示す通り、回転炉床3の回転方向Xへの回転により被処理物 W_2 、 W_4 が灰排出口10の内側に寄せられるように上方より見て回転方向Xに対し内側に傾斜した各2個の平板状の案内羽根7b、7dが間隔をおいて固設され、案内羽根7b、7dの下端は回転炉床3上面と略平行で僅かな間隔を有し被処理物を鋤返し可能としている。更に攪拌軸2aの一端に吊下げられている連鎖状の攪拌鎖8が端末を回転炉床3上面を引摺り可能な長さに固着され、攪拌鎖8の引摺り作用により塊状の被処理物がはぐされる。攪拌軸2aの他端部には案内羽根7dの最外側に間隔をおいて回転炉床3外周部の掻寄せのため1個の案内羽根7eが固着されている。案内羽根7eの向きは案内羽根7dと同一でなくてもよい。ここで攪拌鎖8及び／又は案内羽根7eは必ずしも装着しなくてもよい。攪拌軸2bには図2に示す通り、回転炉床3の回転方向Xへの回転により被処理物 W_1 、 W_3 が灰排出口10の外側に寄せられる

ように上方より見て回転方向Xに対し外側に傾斜した各2個の平板状の案内羽根7a、7cが間隔をおいて固設され、案内羽根7a、7cの下端は回転炉床3上面と略平行で僅かな間隔を有し被処理物を鋤返し可能としている。案内羽根7a、7b、7c、7dは各2個として説明したが被処理物の形態及び／又は廃棄物焼却炉の直径に合わせ適宜選択し複数個設ければよい。

【0008】以下に、廃棄物焼却炉1の他の選択的構成要素を説明する。図1、6に示す被処理物供給部として焼却炉本体4の上端部にスクリュ投入機9と被処理物供給配管13が固設されている。スクリュ投入機9は、下端に被処理物取入口9cが開口した重力方向の被処理物落下方向Qに長手の円筒状樋9aと樋9a内を上方の駆動機15により回転可能に軸支された縦型のスクリュ9bとを有し、樋9a上部に被処理物供給配管13が軸心水平に横付けされている。被処理物供給配管13は、被処理物供給源に供給ポンプ（図示省略）が連結された導入配管13aと、断面を絞った絞り管13bを有し、供給配管13aと絞り管13bとが連結され、絞り管13bの細径側が円筒状樋9a上部に横付けされている。被処理物供給部は被処理物の形態によっては、単純に被処理物供給源に供給ポンプよりの配管を連結しただけの構成でもよい。被処理物の形態によって案内羽根7a、7b、7c、7dは、平板状に代えて図3に示すように、回転炉床3上面に間隔をおいて下端が湾曲面を有する案内羽根7a'、7b'、7c'、7d'を配置することができる。この湾曲面の形状は、被処理物の形態に合わせて各種形状が選択可能であるが、例えば円弧、楕円、拋物線等の一部又はこれらの組み合わせ、或いは鋤若しくは犁の先端部形状等が用いられる。通常塊状となりやすい被処理物の場合には、ここを湾曲面形状特に鋤若しくは犁の先端部形状とすることにより強力な鋤返し作用が可能であり望ましい。

【0009】次に、廃棄物焼却炉1の作動について説明する。都市下水或いは工場排水等の高水分汚泥の脱水ケーキ等の被処理物は通常含水率は80%にも達する。この被処理物の燃焼を効率良く行うには、脱水ケーキの乾燥を促進するため脱水ケーキを乾燥途中において、できるだけ大きな塊とならないように、小塊に解砕して、表面積を万遍なく拡大するようには必要があり、廃棄物焼却炉1は前記構成によりこれらを達成している。図2において、炉内Aに外部より被処理物供給部から投入された被処理物 W_1 が先ず回転方向Xに例えば0.2～0.5rpmの低速回転している回転炉床3に落下して外側の被処理物 W_2 の位置に載置され、攪拌軸2a一端から吊下げられている連鎖状攪拌鎖8の端末によって回転炉床3上面を引摺られ、小塊に破砕される。ついで、被処理物 W_2 は回転炉床3の回転方向Xへの回転により被処理物 $W_2 \rightarrow W_3 \rightarrow W_4 \rightarrow W_5$ と移行するが、攪拌軸2a、2bに固着されている案内羽根7b→7c→7d

→7 aに逐次案内されて回転方向Xに対し内側→外側→内側→外側とジグザグ状の被処理物炉内移動方向Zに向きと位置を変え小塊に解砕されつつ回転し、逐次回転炉床3の内側に寄せられ、灰排出口10の直ぐ外側位置に達する。この間被処理物のジグザグ状の移行により滞留時間が増加し、又小塊への解砕作用により被処理物に空隙が増大し乾燥用熱風が通過する表面積が増大するので熱交換を効率良く達成できる。炉内Aの温度は助燃バーナ5を用いれば例えば800～850℃程度に調整が容易である。図3に示す下端湾曲面を有する案内羽根7

a'、7 b'、7 c'、7 d'を用いた場合には、被処理物W₂～W₅は鋤返し方向Sに移動し、この鋤返し作用により更に乾燥、焼却を効率よく遂行できる。
 【0010】一方冷却空気取入口12 a、12 aから攪拌軸2 a、2 b内に送られて来た冷却空気は、冷却空気吹出口11より回転方向Xと逆向きの冷却空気吹出方向Yに水平から下方に向けて分散して炉内Aに放出され、これにより炉内Aのガス流に旋回流を起こさせ、被処理物の燃焼熱を炉壁方向へ流すことにより未乾燥処理物に吹付けることにより、燃焼熱が乾燥に有効に作用し、被処理物の乾燥、焼却が促進される。従来技術では、燃焼空気吹出口よりの燃焼空気吹出方向は、垂直下向き方向に放出されていたが、垂直下向き方向では被処理物に集中的に空気が当たり、局部燃焼を起こしその部分が高温となり部分的にクリンカー状に固化し、案内羽根に引掛かったり、炉内での完全燃焼が困難で炉内の閉塞が起こりやすかったが、廃棄物焼却炉1ではこの課題は解消可能である。又、ここで燃焼空気取入口12 a、12 aから送られて来た燃焼空気により攪拌軸2及び案内羽根7 a、7 b、7 c、7 dの温度上昇を防止できる。最終的に灰排出口10の直近の外側に達し次第に滞積した乾燥、焼却済の被処理物は、灰排出口10周囲に突設された縁部を乗り越えて灰排出口10より炉内Aの外へ排出され、図示省略した別工程の灰処理装置へ送られる。燃焼後の排ガスは排ガス排出口16より排ガス排出方向Rに排出され、図示省略した別工程の排ガス処理装置へ送られる。

【0011】スクリュウ投入機9を用いる場合は、供給配管13 aに被処理物供給方向Pに被処理物を例えば供給ポンプにより供給し、一旦絞り管13 bで絞込んだ後、円筒状樋9 a上部で放出膨張せしめ、例えば30～200rpmの高速回転しているスクリュウ9 bの羽根によって被処理物を拳程度の小塊状に切断しつつ炉内Aへ被処理物落下方向Qに落下させる。スクリュウ投入機9は、粘着性の被処理物を供給ポンプにより直接炉内Aへ供給した場合には、連続状態に繋がって落下しやすく、かかる被処理物を小塊状とするのに特に効果的である。又スクリュウ9 bを縦型としたことにより、切断された被処理物が相互に再合体するのを防止するのに有効である。

【0012】

【発明の効果】本発明の廃棄物焼却炉によれば、都市下水或いは工場排水等の高水分汚泥の脱水ケーキ等の被処理物を燃焼中に部分的にクリンカー状に固化することもなく、炉内での完全燃焼が可能で炉内の閉塞を招来することもなく、効率的に乾燥し燃焼を促進することのできる。又、スクリュウ投入機を付加することにより、粘着性の被処理物が連続状態に繋がって落下することなく小塊状に切断でき、炉内でのより効率的な乾燥及び燃焼が可能である。更に、下端湾曲面を有する案内羽根を用いた場合には、被処理物は強力な鋤返し作用を受けることができ、尚一層乾燥、焼却を効率よく遂行できる。

【図面の簡単な説明】

【図1】本発明の廃棄物焼却炉の一例の全体を示す一部縦断面図である。

【図2】図1の廃棄物焼却炉の回転炉床部をB・B方向に視た概略平面図である。

【図3】本発明の廃棄物焼却炉の案内羽根の他例を示す概略側面図である。

【図4】図1、2の廃棄物焼却炉の攪拌軸部の概略説明図である。

【図5】図1、2の廃棄物焼却炉の攪拌鎖部の概略側面図である。

【図6】図1、2の廃棄物焼却炉のスクリュウ投入機を示す一部縦断面図である。

【符号の説明】

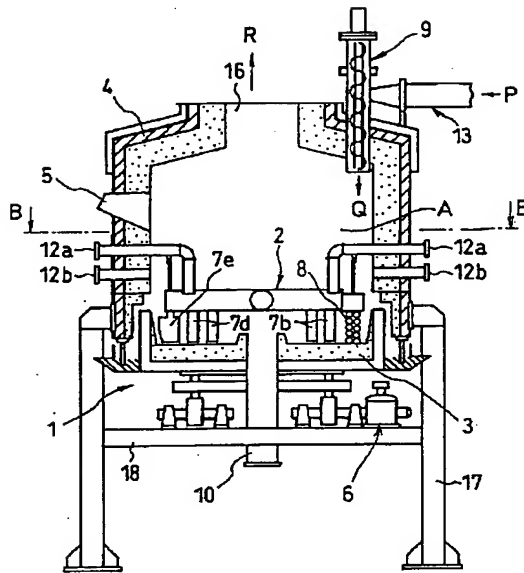
- 1 廃棄物焼却炉
- 2、2 a、2 b 攪拌軸
- 3 回転炉床
- 4 焼却炉本体
- 5 助燃バーナ
- 6、15 駆動機
- 7 a～7 e、7 a'～7 d' 案内羽根
- 8 攪拌鎖
- 9 スクリュー投入機
- 9 a 樋
- 9 b スクリュー
- 9 c 被処理物取入口
- 10 灰排出口
- 11 燃焼空気吹出口
- 12 a、12 b 燃焼空気取入口
- 13 被処理物供給配管
- 13 a 導入配管
- 13 b 絞り管
- 16 排ガス排出口
- 17 架台
- 18 フレーム
- A 炉内
- O 回転中心
- P 被処理物供給方向

Q 被処理物落下方向
R 排ガス排出方向
S 鋤返し方向
X 回転炉床回転方向

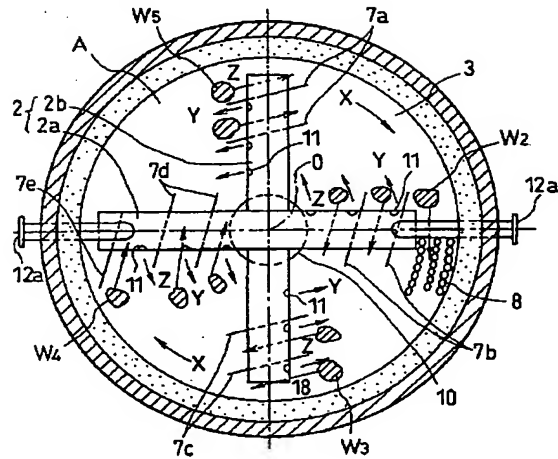
* Y 燃烧空氣吹出方向
Z 被処理物炉内移動方向
W₁ ~ W₅ 被処理物

*

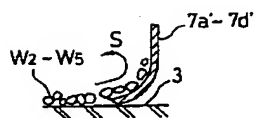
【図 1】



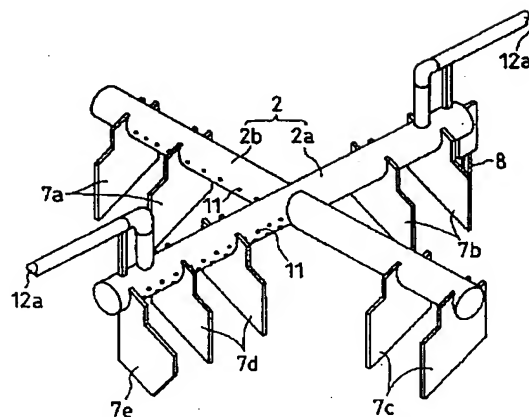
【図 2】



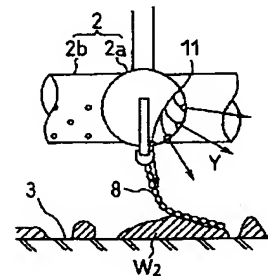
【図 3】



【図 4】



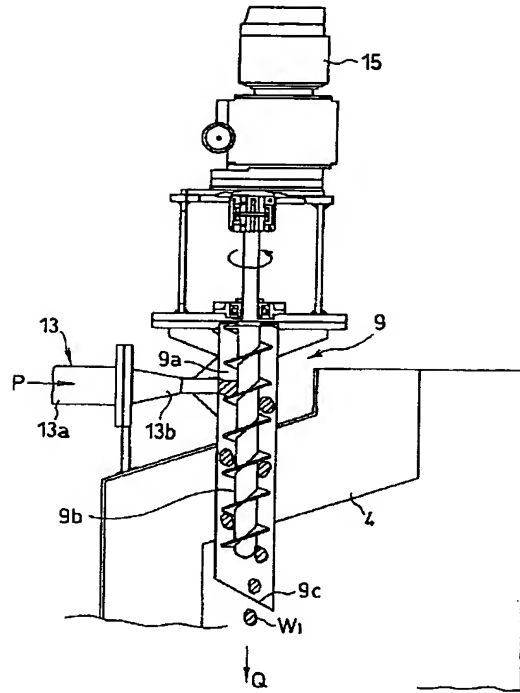
【図 5】



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【図 6】



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